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Problems of Teaching Library Automation

Introduction

I WILL NOT PRETEND that the sentiments expressed here are anything other than personal views arising from my teaching certain courses in the Graduate School of Library Science at the University of Illinois. It would be presumptuous to declaim on the problems of higher education in general, and boring to delineate problems specific to this particular school. Between those extremes, however, there are problems likely to be shared by other instructors at other schools, problems of some consequence to the library field in general. To deal with these problems candidly, I have not limited myself to "safe" topics such as the need for more money. If some of the "unsafe" topics give offense they should be understood in terms of bringing important issues to light.

Purposes of the Course

I might reasonably begin by considering what is to be accomplished in a course in library automation. In my own course I have characterized its purpose in terms of three major goals. The first of these is that the student become familiar with the uses of computers in libraries. This means not only exposure to existing and potential applications but also consideration of difficult and complex issues. Typical issues are autonomy versus cooperation, turnkey systems versus independent development, and the promulgation of standards. Students soon learn that many

decisions in automation hinge not on technical issues but on ethical questions (the protection of privacy) or value judgments (the relative worth of two kinds of service).

The second goal of the course is that the student be able to read and understand a substantial body of automation literature. In more concrete terms, students should be able to understand nearly all automation articles appearing in general interest library journals, most of the articles in *Journal of Library Automation* and at least some of the articles from *Journal of the American Society for Information Science*.

The third goal of the course is that students be able to communicate technical requirements to programmers, systems analysts and other non-librarians.

The Problem of Understanding Technical Material

In order to understand the problems associated with familiarizing students with computer applications, we may profitably examine a representative application in some detail. The classroom treatment of circulation starts with general principles (control, information, statistics, associated services) and proceeds to the consideration of specific systems. One of the systems discussed is Ohio State University's Library Control System (LCS), a large, complex and sophisticated system that lends itself to classroom use. After a "guided tour" look at the most obvious system features we can look at the underlying structure of the system in order to understand its limitations and its possibilities for enhancement. Of course, discussion of structure requires familiarity with computer terminology (character, field, record, etc.) and computer equipment (terminals, disk files, etc.). Actually, establishing enough technical background to make discussion of the LCS system worthwhile requires the first half of the semester. But with that background it is possible for students to understand that the LCS master file consists of variable-length records hashed on call number into half track bins, and that there are multiple index files with pointers to the master file. (This concept takes perhaps an hour to develop in the classroom.)

Understandably, many students find this kind of material heavy going. The anonymous course evaluations at the end of the semester are often sprinkled with phrases such as "this is all so new," "too much background is needed" and similar indications that the course is too difficult. I have even been criticized because the "course required original reasoning." That peculiar complaint aside, it *is* legitimate to ask whether the problem lies with the material or with the preparation of the students.

Traditionally, library science has drawn most of its students from

history, English and education undergraduate majors. We have seen a slightly broader range of undergraduate degrees in the past few years, but most of our students are still from the humanities and many find a technical course an abrupt change from the courses they have been taking. I am generally sympathetic to students who, for reasons of background, need to have the most elementary terms and concepts explained. At the same time, library science is a graduate program here and we expect graduate students to be resourceful and diligent.

People who go into librarianship seem generally to share a love of books and a service orientation. These are highly commendable qualities, but they are not sufficient for addressing the wide range of difficult decisions that face working librarians. Librarians at the management level must prepare budgets, allocate resources, evaluate systems and services of ever-increasing complexity, and make other technical decisions. A decade ago librarians had to be concerned with various methods for preparing catalog cards, but they did not have to consider purchasing a turnkey circulation system, or joining a network, or subscribing to an on-line information retrieval system, or installing an electronic theft-deterrent system. As technical issues of this kind continue to multiply, it seems certain that advancement in the profession will require a willingness to understand and work with the new technology.

An occasional problem is presented by the student with a lofty disdain for science or an undisguised antagonism toward all aspects of technology. It seems to be a peculiar characteristic of higher education that a person in the humanities can take perverse pride in remaining ignorant of the sciences, while a scientist would be deeply embarrassed to be ignorant of the arts. Perhaps this is a carry-over from the days when "real" education was education in the humanities, and practical skills were thought of in terms of the trades. At any rate, the student who feels that poetry is the essence of life and that technology is properly the work of uncreative drudges will find library automation unrewarding. It is difficult to assess the extent of this problem. Library automation is an elective here, so the student with an antipathy toward technology can simply ignore the course.

Students who have trouble with the materials sometimes ascribe the difficulty to its being "too mathematical." Actually, nothing beyond multiplication and division is needed, although even this may be too much for the student who had difficulty with high school math and has taken no math since.* The actual arithmetic is usually simple (and absurdly simple if a calculator is used), but its proper application requires a certain prob-

*The low point (I hope) was reached a few years ago when a student wrote on an examination paper: "I don't know how many zeros go after the 5 in 5 million. . . ."

lem-solving orientation. In other words, the problem is not in the ability to divide but in knowing whether the result represents books per hour or hours per book. The new math seems to have had negligible impact on this.

Problems with the Literature

The second major goal of the course, gaining familiarity with automation literature, suggests consideration of what kind of literature is useful in an automation course. To begin with, there are many fine introductory texts for computer science and business data processing. Excellent as these may be, they do not cover the problems of extended character sets, the archival properties of magnetic tape, the supervision of data entry, the negotiation of computer services, or a vast array of other topics important to librarians. In short, texts directed at computer science and commerce majors are of limited value in library school. Worse, I cannot point to an appropriate, high-quality text written specifically for the student of library science.

Several reasons can be advanced to explain the absence of good texts in this field. For one thing, the technology of library automation moves swiftly; a book dealing with hardware will be two or three years out of date at the time of publication due to the delays inherent in writing, editing and publishing. When the book is only a few years old, it begins to reflect the technology of an earlier time and has to be regarded as history. This point may be illustrated by consideration of how a book written today would differ from a book written five years ago in their respective treatments of keypunching.

There are other problems. Tact and the avoidance of lawsuits will generally compel the author of an automation text to omit some of the most instructive and entertaining material. As an example of this, in my course I describe an unsuccessful automation project at a large public library, all the while attempting to show the relative importance of technology, politics and personality in contributing to the failure. This particular project has been described in a generally worthwhile automation text but the book leaves a very different impression since delicacy and common sense dictated the deletion of any reference to problems. As a further example, I discuss the chaos that resulted at a large university when the administrative and research/instructional computer centers were combined into one physical facility with one staff. The problems there are not problems of hardware but rather problems of politics, personality, temperament and differing objectives. Issues of this kind are often central to the success or failure of a library automation project and they deserve extended discussion in the classroom. But the pressures that cause me to use the phrase "a large university" rather than naming the

school (it is named in the classroom, however) also result in the most sensitive and delicate issues being avoided in print.

Of course, an author can always use a composite scenario or a completely fictional account to illustrate a point. Artificial examples may be better than nothing, but they tend to look artificial and they simply lack the impact of living, breathing, real-world case studies. In library automation case studies, by the way, truth really is stranger than fiction. I have seen and described in the classroom events and practices so bizarre that they could never be used in a fictionalized account.

Having noted the shortcomings of texts in library automation, we can now consider the use of journal articles in teaching automation. It is certainly easy to point to the shortcomings of journal literature—self-laudatory pieces, naïve reinvention of the wheel, opinion pieces masquerading as factual presentations, etc.—but journals still constitute a very important mechanism for keeping informed. The problem is thus not the quality of this literature, but rather teaching the student to recognize the wheat in the mountains of chaff published. My approach to this problem is to require the students to select a recent article and write a critique of it. Students generally read several articles in order to find one that they feel confident in reviewing and in this way they encounter articles that would never appear on a reading list. Many students are pleasantly surprised to find that they can read, understand and intelligently review a "technical" article that they would have skipped as "too technical" had they not taken the course. Moreover, most of the students come to realize that automation literature is quite extensive and ranges from the scholarly to the trivial.

Problems of Communication

The third major goal of the course is to enable students to communicate automation requirements to programmers, systems analysts and other nonlibrarians. This is a doubly troublesome area. The first part of the problem is that students often misunderstand the librarian's role in the design process. After all, can't the design simply be delegated to competent designers? The answer to that is a resounding *No*!—or at least it should be if the library is to stay out of trouble. Naturally, most of the students in an introductory automation course will never design a complex system, but they will need to select from competing systems; they will need to select features and options; they will need to describe design changes dictated by their circumstances; and they will need to write functional specifications. While doing all this, they should develop an understanding of what can reasonably be delegated. Librarians who delegate too much can be embarrassed by the result. Several years ago a large

library created a book catalog and the only sorting rule they provided the programmers was that "&" should file as "and." As can be imagined, the resultant list was not in traditional library order and it required considerable effort on the part of the library to create a more complete and accurate set of rules.

In order to help students develop some skill in this area I require them to write functional specifications for some moderately complex product or service. Most recently, I have had them describe to a nonlibrarian programmer how they want a MARC record displayed on a CRT. (The premises are that the CRT terminal will replace the card catalog, and that the format must be suitable for patron use in a public library.) Reaction to this kind of assignment has been mixed. A representative from a turnkey vendor thought it was an excellent assignment and asked to see the better papers. The students generally regarded it as a terrible assignment. Excellent or terrible, it is a difficult task and for many of the students, a painful one. It has to be painful to spend hours preparing a multipage report only to have it criticized line by line. My hope is that they will be better prepared when the thing at stake is not a grade on a paper but a $100,000 turnkey system in the library.

The second part of the problem is that students vary in their ability to communicate clearly and effectively. They may have a clear idea of the feature or process they want, but experience great difficulty writing the requirement in terms understandable to a programmer or systems analyst. All of the usual problems of expository writing, such as misplaced modifiers and ambiguous antecedents, occur here, but two aspects peculiar to technical writing deserve special attention. The first is that students are inclined to use jargon unnecessarily. It seems unreasonable that a librarian asking a nonlibrarian programmer for a CRT screen layout would expect the programmer to understand the distinction between a secondary added entry and an alternative added entry, but students regularly make errors of this kind. It is all the more remarkable when one considers that most of the students were themselves ignorant of this distinction only a few weeks or months earlier. The closely related problem is that students seem always in danger of losing the "outsider" point of view. In order to see a new system or service in the way it will be seen by the naïve user or the occasional user, students may be required to remember how complex and confusing the library seemed before they became professionally involved. Or, it may be necessary to realize that intelligent, mature library users generally have very little understanding of how libraries operate (and, furthermore, there is no reason why they should).

Reluctance to Challenge

One of the purposes of an education for librarianship is to convey to the student a body of reasonably factual information, a purpose well understood by teacher and student alike. An equally important purpose is to impart a professional attitude, a way of dealing with the value judgments that underlie so many library decisions. There is, for example, no "correct" answer to the question: "Should I reduce the book budget in order to keep the library open later?" Questions of this sort are central to librarianship, but they cannot be treated directly in the classroom in the way that factual issues are presented. A primary difficulty in addressing this problem is that students tend to regard all the material presented in the classroom as factual and will accept without hesitation the most outrageous and idiosyncratic statement of personal opinion expressed by the instructor. To be fair to the student, the more technical the area the harder it is for the student to distinguish fact from opinion. I often find it necessary to append the caveat that I am expressing an opinion and that others in the field have differing opinions. It is not my intent to turn out a class of cynics, but students should recognize a value judgment when they see one and realize that someone else's value judgment is not necessarily more valid because it appears in print or is delivered from a lectern. In short, students are often reluctant to challenge the existing order (possibly because they fear it will make them less employable) and they must be given considerable encouragement to speak up.

Lack of Vision

Five years ago, when I described the OCLC network in class many students regarded it as an interesting development but not one likely to affect their careers. Today, of course, the significance of OCLC is obvious to everyone, but there are newer developments that may be viewed as likely trends or as science fiction depending on whether one is an instructor or a student. Again, to be fair to the students, they hear predictions ranging from the nearly obvious (networking will become more extensive) to the fanciful (the contents of the Library of Congress will be encoded on a thumbnail-sized chip). Without a strong scientific background it may be difficult to assess the plausibility of a particular prediction. The problem, however, is not that students have difficulty with technological assessment, but rather that they may reject out of hand any development that goes very far beyond their own experience. It is easy (and perhaps uncharitable) to ascribe this to lack of imagination, but I suspect that wishful thinking plays an equally important role. The student who is not comfortable with technology may consciously or uncon-

sciously feel that the technological revolution will come to someone else's library. This is, of course, a highly unrealistic view, since technology is frequently thrust upon librarians for reasons beyond their control. In any case, the problem continues but it is not nearly as serious as it was a few years earlier. Possibly this improvement in attitude is a result of students seeing firsthand the sweeping changes that have been made and are being made in the University Library here. It is one thing to hear an automated circulation system described in the classroom, and quite another to sit at a terminal and browse the collection.

Solutions

The reader who expects all the problems cited in this paper to be resolved in the final paragraph will be disappointed. I will, however, mention two concrete steps taken by the Graduate School of Library Science to strengthen its degree programs. As the first step, we have actively encouraged undergraduates in the sciences to consider careers in librarianship. The number of science majors attracted through our recruitment efforts is modest but nonetheless adequate for the level of effort. It is not at all clear whether more aggressive recuitment would substantially increase the number of applications from science majors.

The second step has much broader implications. The Graduate School of Library Science has designed a 2-year MSLS program that will require students to take undergraduate-level courses in management, computer science and statistics (taken from other departments of the university) and will require library school courses in library automation and information retrieval. At this writing the program awaits approval by the university. It is expected that the inclusion of computer science and statistics requirements, together with the greater expense to the student of a 2-year program, will reduce applications. On the other hand, if the students who do apply for the 2-year program demonstrate greater dedication and better preparation, then strengthening the MSLS program will have been the right move.